80 Grote Street Adelaide SA 5000
P 8172 1088 E enquiry@southfront.com.au
ABN 96 007 344 191

Our Ref: 22019-2B/DJ/DJ

24 May 2022

Simon Abboud
Senior Civil Engineer / Associate
WGA
60 Wyatt Street
ADELAIDE SA 5000

Dear Simon

Golden Grove DPA Flood Mapping

We have completed our flood assessment of the watercourses within the proposed area.

Background

A Development Plan Amendment (DPA) is proposed for an area with Golden Grove, located to the east of Crouch Road. The purpose of this investigation is to provide an assessment of post-development flood risk through this land.

Hydrology

The hydrological inputs for the flood model have been extracted from a DRAINS model provided by WGA for this assessment. This model includes catchments for the proposed development site and a number of external upstream catchments.

The critical duration hydrographs for each catchment and basin outflow were extracted for use in the modelling, regardless of whether the durations were aligned. This is a slightly conservative approach.

The 1% AEP (100 year ARI) post-development scenario was modelled for this assessment.

Hydraulic Model

A computer-based hydraulic model of the subject land was created using the TUFLOW flood modelling software. The topography of the watercourses and the surrounding land was defined using the supplied 3D terrain model which has a grid spacing of 4m. The supplied data was converted into a digital elevation model for use in the TUFLOW model.

Hydrographs from the DRAINS model were used as inflows in the TUFLOW model. The hydrograph arriving at each detention basin was divided into thirds and applied to the watercourse centreline at progressive locations along the upstream watercourse reach. The hydrograph in some instances was further divided where the watercourse reach splits into multiple branches. Detention basin outflow hydrographs were applied to the surface just downstream of each basin.

Detention basin details as determined in the supplied WGA DRAINS model were represented in the model by inserting raised embankments across the creek channel at their proposed locations. Basins were allowed to fill to the maximum water level in the 1% AEP storm event as determined in the

DRAINS model, to ensure that this downstream boundary condition for each watercourse reach was accounted for in modelling of the upstream watercourse reach.

Model Results

Flood mapping of the watercourse reaches was undertaken for the 1% AEP rainfall event and is attached with this report. Flood height contours are included on the flood map, and the raw flood depth, height and hazard grid outputs are attached with this report.

In some locations, it is noted that the 1% AEP flood plain has a relatively wide flow width. The majority of this inundation is very shallow as highlighted on the flood map where the water depth is below 25 mm. It is anticipated that through considered design of the development that these shallow flows can be safely contained within a narrower corridor. Flow widths in the channels between basins (i.e. in downstream reaches) were found to be relatively narrow and well contained.

Please contact this office should you require any further assistance with this matter.

Yours sincerely

Drew Jacobi BEng (Hons) FIEAust CPEng NER
Principal Engineer

Enc: 1% AEP Flood Map
Flood Height Grid

LEGEND

Flood Depth Contour Band

- 0m to 0.1m
- 0.1m to 0.25m
- 0.25m to 0.5m
- 0.5m to 1m
- 1m to 1.5m
- 1.5m to 2.5m
- 2.5m to 5m
- 5m to 100m

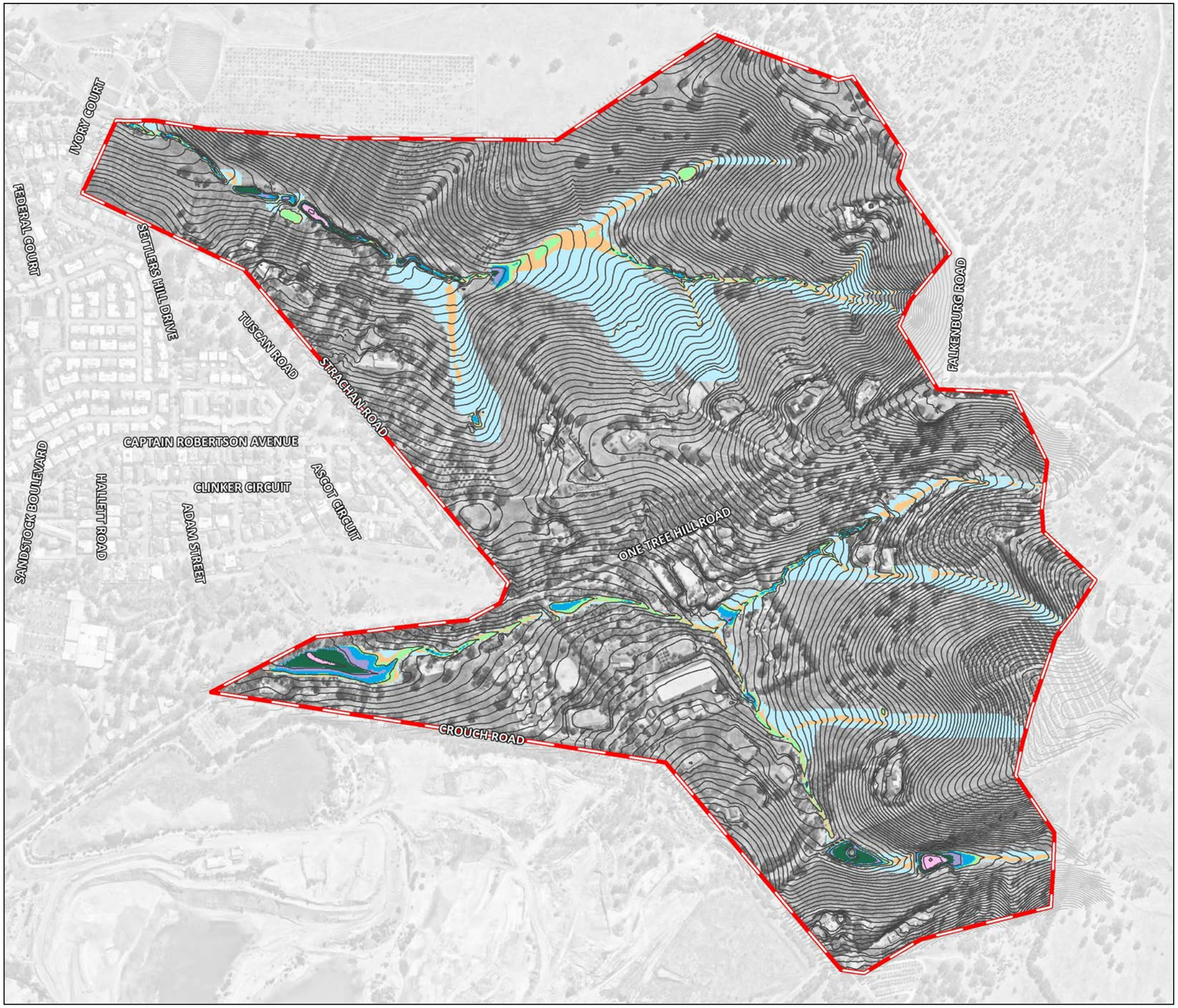
Floodplain Study Area

Contour (1m)

N

0 500

metres



Background

This map has been prepared using currently available technology to a standard of accuracy sufficient for broad scale flood risk management and planning. The map does not increase the risk or affect the level of flooding over an area or property. It merely seeks to identify the extent of flooding over a given set of conditions. Limitations to the information shown on this map and a brief description of some concepts upon which it is based are set out below.

Flood Risk Probability

Flood risk can be considered in terms of:

- Exceedances per Year (EY): the number of times an event is likely to occur or be exceeded within any given year;
- Annual Exceedance Probability (AEP): the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage.

Generally, EY terminology is used for Very Frequent design rainfalls and AEP (%) terminology is used for Frequent and Infrequent design rainfalls.

Storm Durations

The flooding response of a catchment is dependent on the duration of any storm event. Generally shorter, more intense storms produce the greatest flows from urban areas. Longer duration, but less intense storms produce the greatest flow from undeveloped rural areas.

Scope of Mapping

The limit of flooding on this map is not a boundary between flood prone and flood free land.
Land outside the flood extent shown on this map could be affected by:

- Storms with different Annual Exceedance Probability;
- Flooding from local drainage systems which can occur as a result of localised intense rainfall or drain blockage.

Areas of very shallow flooding

In areas shown as being affected by flood depths of less than 0.1m, machine plant, temporary stockpiles, fences, land excavation and buildings will affect the flow of floodwaters. Resolution to this level of detail is beyond the capabilities of the modelling process and consequently the level of certainty in relation to flood depths in these areas is reduced.

Effect of debris on flood extent

Vegetation and other debris are likely to be carried by flood flows and may cause blockages in creeks and culverts. This cannot be predicted and consequently the impact of blockages is not modelled. If blockages do occur, flood extents will vary from those shown on the map.

Disclaimer

This map is provided on the basis that those responsible for its preparation and publication do not accept any responsibility for any loss or damage alleged to be suffered by anyone as a result of the publication of the map and the notations on it, or as a result of the use or misuse of the information provided herein.
The data contained on this map is based on survey, hydraulic and hydrological modelling to accuracy sufficient for broad scale flood risk management and planning.
Further development, earthworks and other changes to the catchment may affect the actual flood extents.
The modelling reflects current practice but it may be realised that there are uncertainties and assumptions associated with the data and the processes on which the models are based, and therefore the flood extents shown on this map cannot be regarded as exact predictions.
The flood extents are not based on actual historical floods.

Data Sources:
Southfront (Flood Depth and Extent)
NearMap (Aerial Photograph)
DataSA (Roads)

southfront

WGA
Golden Grove DPA
Figure 1: 1% AEP Floodplain Map